CLAIMS

1. Use of a crosslinkable liquid silicone formulation comprising:

A – a system for generating a film-forming silicone network containing at least one polyorganosiloxane (POS) resin exhibiting, per molecule, on the one hand at least two different siloxyl units chosen from those of types M, D, T, Q, one of the units being a T unit or a Q unit, and on the other at least three hydrolysable/condensable groups of types OH and/or OR^1 where R^1 is a C_1 to C_6 linear or branched alkyl radical;

B – a system promoting anchorage of said network to the surface of the textile material, consisting of

• either B-1 at least one metallic alkoxide with the general formula:

$M[(OCH_2CH_2)_a\ OR^2]_n$ (I)

in which:

- M is a metal chosen from the group formed by: Ti, Zr, Ge, Si, Mn and Al;
- n = valency of M;
- the substituents R^2, identical or different, each represent a C_1 to C_{12} alkyl radical, linear or branched;
- a represents 0, 1 or 2;
- with the conditions according to which, when the symbol a = 0, the alkyl radical R^2 possesses from 2 to 12 carbon atoms, and when the symbol a is 1 or 2, the alkyl radical R^2 possesses from 1 to 4 carbon atoms;
- optionally, the metal M is linked to a ligand;

• or B-2 at least one metallic polyalkoxide resulting from the partial hydrolysis of the monomeric alkoxides of formula (I) mentioned above, in which the symbol R^2 has the afore-mentioned meaning with the symbol a = 0 ;

• or a combination of B-1 and B-2;

• or B-3 a combination of B-1 and/or B-2 with:

- B-3/1 at least one optionally alkoxylated organosilane containing, per molecule, at least one C_2-C_6 alkenyl group,

- and/or B-3/2 at least one organosilicic compound containing at least one epoxy, amino, ureido, isocyanato and/or isocyanurate radical;

C – a functional additive consisting in:

• either C-1 at least one silane and/or at least one essentially linear POS and/or at least one POS resin, each of said organosilicic compounds being equipped, per molecule, on the one hand with anchorage functions (AF) capable of reacting with A and/or B or capable of generating in situ functions capable of reacting with A and/or B and on the other with hydrophobicity function(s) (HF) which can be identical to or different from the AFs;

• or C-2 at least one hydrocarbon compound containing at least one linear or branched, saturated or unsaturated hydrocarbon group and optionally one or more heteroatom(s) other than Si and present in the form of a monomeric, oligomeric or polymeric structure, said hydrocarbon compound being equipped, per molecule, on the one hand with anchorage function(s) (AF) capable of reacting with A and/or B or capable of generating in situ functions capable of reacting with A and/or B and on the other with hydrophobicity function(s) (HF) which can be identical to or different from the AFs;

• or a mixture of C-1 and C-2;

D – optionally a non-reactive additive system consisting of: (i) at least one organic solvent and/or one non-reactive organosilicic compound; (ii) and/or water;

with the condition according to which there are utilised (the parts are given by weight):

- per 100 parts of constituent A,
- from 0.5 to 200 parts of constituent B,
- 1 to 1,000 parts of constituent C and
- from 0 to 10, 000 parts of constituent D,

in order (i) to coat a textile material and/or threads, fibres and/or filaments constituting the textile material in such a manner that the silicone formulation crosslinks around the threads, fibres and/or filaments constituting the textile material and forms around them a crosslinked silicone sheath, and (ii) to confer on said textile material in a durable manner water repellency and impermeability, without affecting substantially the intrinsic respirability of the textile material.

2. Use according to claim 1, in order to confer on the textile material a beading effect of between 80 and 100 % according to the method Spray Test AATC Test Method 22-1996.

3. Use according to claim 1, in order to confer on the textile material a beading effect of between 80 and 100 % according to the method Spray Test AATC Test Method 22-1996, said beading effect being maintained at a value of between 70 and 100 % after 8 hours of continuous washing in machine with water at 50 °C.

4. Use according to either claim 1 or claim 2, in order to confer on the textile material an impermeability to liquid water corresponding to a water column greater than or equal to 10 cm, preferably to 15 cm, in more preferred manner to 20 cm of water, as measured by the Schmerber test ISO Test Method 811-1981.

5. Use according to either claim 1 or claim 2, in order to confer on the textile material an impermeability to liquid water corresponding to a water column greater than or equal to 10 cm, preferably to 15 cm, in a more preferred manner to 20 cm of water, as measured by the Schmerber test ISO Test Method 811-1981, said impermeability remaining greater than or equal to 10 cm, preferably to 15 cm, in a more preferred manner to 20 cm of water after 8 hours of continuous washing by machine with water at 50 °C.

6. Use according to any one of claims 1 to 5, in order to confer on the textile material in addition properties of reduced water absorption.

7. Use according to any one of claims 1 to 6, in order to confer on the textile material in addition properties of rapid drying.

8. Use according to any one of claims 1 to 7, wherein the textile material is capable of being used for the production of sportswear.

9. Use according to any one of claims 1 to 8, in which the radical R^1 of constituent A is a C_1 to C_3 linear or branched alkyl radical.

10. Use according to any one of claims 1 to 9, wherein there is used as constituent A a mixture A-3:

- of at least one resin possessing, in its structure, at least two different siloxyl units chosen from those of formula $(R^3)_3SiO_{0.5}$ (unit M), $(R^3)_2SiO$ (unit D) and $R^3SiO_{1.5}$ (unit T), at least one of said units being a T unit, the OH and/or OR^1 groups being able to be borne by the M, D and/or T units and the content by weight of OH and/or OR^1 groups lying between 0.2 and 10 wt %, and
- of at least one other resin possessing, in its structure, at least two different siloxyl units chosen from those of formula $(R^3)_3SiO_{0.5}$ (unit M), $(R^3)_2SiO$ (unit D) and $R^3SiO_{1.5}$ (unit T) and SiO_2 (unit Q), at least one of said units being a Q unit, the OH and/or OR^1 groups being able to be borne by the M, D and/or T units and the content by weight of OH and/or OR^1 groups lying between 0.2 and 10 wt %,
- the R^3 radicals present in said resins being identical or different and being chosen from C_1-C_6 linear or branched alkyl radicals, C_2-C_4 alkenyl, phenyl, trifluoro-3,3,3 propyl radicals.

11. Use according to any one of claims 1 to 10, wherein a constituent B-1 is used containing an alkyl titanate, an alkyl zirconate, an alkyl silicate or a mixture of at least two of them, and/or as constituent B-2 a polytitanate B-2 produced by the partial hydrolysis of isopropyl titanate, butyl titanate or ethyl-2-hexyl titanate, a polyzirconate B-2 produced by the partial hydrolysis of propyl and butyl zirconate, a polysilicate B-2 produced by the partial hydrolysis of ethyl and isopropyl silicate or a mixture of at least two of them.

12. Use according to claim 11, wherein the constituent B-1 contains a compound chosen from ethyl titanate, propyl titanate, isopropyl titanate, butyl titanate, ethyl-2-hexyl titanate, octyl titanate, decyl titanate, dodecyl titanate, β-methoxyethyl titanate, β-ethoxyethyl titanate, β-propoxyethyl titanate, titanate of formula $Ti[(OCH_2CH_2)_2OCH_3]_4$, propyl zirconate, butyl zirconate, methyl silicate, ethyl silicate, isopropyl silicate, n-propyl silicate and a mixture of at least two of them.

13. Use according to any one of claims 1 to 12, wherein a constituent C-1 is used containing:

(i) a essentially linear diorganopolysiloxane containing a hydroxyl group at each chain end, with the formula:

X

in which:

+ the substituents R^{18}, identical or different, each represent a C_1 to C_{13} saturated or unsaturated monovalent hydrocarbon radical, substituted or non-substituted, aliphatic, cyclic or aromatic;

+ j has a value sufficient to confer on the diorganopolysiloxane of formula (III) a dynamic viscosity at 25 °C ranging from 50 to 10, 000, 000 mPa.s;

(ii) a hydroxylated POS resin containing in its structure siloxyl units T and optionally M and/or optionally D;

(iii) a hydroxylated POS resin which may be obtained:

→ by hydrolysis of an alkoxysilane S substituted by HFs;

→ by homocondensation of the hydrolysed silanes S;

→ and by stripping of the hydrolysates derived from the HFs;

(iv) a mixture of at least two of the compounds (i), (ii) and (iii).

14. Use according to claim 13, wherein a hydroxylated MDT resin having a content by weight of group OH of between 0.2 and 10 wt % is used.

15. Use according to any one of claims 1 to 14, wherein a fluorinated alcohol is used as constituent C-2.

16. Use according to claim 15, in which a perfluorinated alcohol of the formula:

$$R^{19} - OH \quad (IV)$$

where R19 represents an aliphatic, linear or branched radical having from 2 to 20 carbon atoms, said carbon atoms being substituted by at least one fluorine atom and optionally by at least one hydrogen atom, is involved.

17. Use according to claim 16, wherein a perfluorinated alcohol of the formula R^F-$(CH_2)_m$

OH, where R^F represents the group $-C_sF_{2s}-CF_3$ with s equal to or different from zero or the group $C_sF_{2s}H$ with s equal to or more than 1, and m is a number 0 to 10, is involved.

18. Use according to any one of claims 1 to 17, wherein the liquid silicone formulation also contains a polycondensation catalyst.

19. Use according to any one of claims 1 to 18, wherein the liquid silicone formulation also contains a filler.

20. Use according to any one of claims 1 to 19, wherein the liquid silicone formulation is prepared in concentrated form, and is then diluted at the moment of its use with an organic diluent, an organic solvent or water at the rate of 1 to 30 parts by weight of formulation per 100 parts by weight of solvent, diluent or water.

21. Use according to any one of claims 1 to 20 for the application of the composition directly to the textile articles containing at least one textile surface.

22. Use according to any one of claims 1 to 21 for the application of the composition to the threads, fibres and/or filaments during the process for production of the textile material.